Uppgift 1

Tentamen 20-04-28 0003-MDC

1,

a) $Y = B_0 + B_1 X_1 + B_2 X_2 + B_3 X_3 + B_4 X_4^2 + \delta_1 \hat{Y}^2 + \delta_2 \hat{Y}^3$ + error

b) $H_0: \delta_1 = \delta_2 = 0$ } Ursprunglig modell är korrekt

$H_A: \delta_1$ och/eller $\delta_2 \neq 0$ } —||— modell <u>inte</u> korrekt

c) Om vi jämför erhållet p-värde från vår Reset-output (= 0,01234) med kritiskt värde = $F^{(0,05)}_{2,\, n-k-2} = F_{2,\infty} = 3,00$ Så kan vi anta att vår ursprungliga modell inte är korrekt.

Uppgift 2

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Uppgift 2

a) $H_0: \rho = 0$ } no Sample Selection problem

This can be tested with a t-test.
Using test-statistic $\hat{\lambda}$: Inverse Mills-ratio

b) Since $\hat{\lambda}$ is small = 0,2885 we fail to reject H_0 at all fair levels. Meaning ρ might be zero.

c) Comparing the OLS-estimates with the Heckit-estimates there is not a large difference in the estimates return to education. Which confirms our result regarding the test in b). There is a larger difference between the estimates St. errors, this might be because of the difference in the amount of observations.

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Uppgift 3

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Uppgift 3

$$y = B_0 + B_1 X_1 + B_2 X_2 + u$$

$H_0: B_1 = 2B_2$ Defining: $\theta = 2B_2 - B_1$

$$B_1 = 2B_2 - \theta$$

$$Y = B_0 + (2B_2 - \theta)X_1 + B_2 X_2 + u$$

$$y = B_0 + \underline{2B_2 X_1} - \theta X_1 + \underline{B_2 X_2} + u$$ √ -10 p.

Now, if we redefine the variables we can estimate the model and create a t-test with hypothesis:

$H_0: \theta = 0$ against $H_A: \theta \neq 0$

If $H_0: \theta = 0$ is true, then $H_0: B_1 = 2B_2$ also is true.

Uppgift 4.

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Uppgift 4

$SSR_{ur} = SST(1-R^2_{ur})$

$SSR_r = SST(1-R^2_r)$

$$\frac{\frac{SST(1-R^2_r) - SST(1-R^2_{ur})}{q}}{\frac{SST(1-R^2_{ur})}{n-k-1}}$$

$$= \frac{\cancel{SST}(1-R^2_r) - \cancel{SST}(1-R^2_{ur})}{\cancel{SST}(1-R^2_{ur})} \cdot \frac{n-k-1}{q}$$

$$\Rightarrow \frac{(1-R^2_r)-(1-R^2_{ur})}{1-R^2_{ur}} \cdot \frac{n-k-1}{q}$$

$$\Rightarrow \frac{\frac{(1-R^2_r)-(1-R^2_{ur})}{q}}{\frac{1-R^2_{ur}}{n-k-1}} \Rightarrow \left.\frac{\frac{R^2_{ur}-R^2_r}{q}}{\frac{1-R^2_{ur}}{n-k-1}}\right\} \text{Proof!}$$

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